

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
14 July 2005 (14.07.2005)

PCT

(10) International Publication Number
WO 2005/064590 A1

(51) International Patent Classification⁷: **G10K 11/36**,
G01R 33/02, H01L 41/00, G11C 11/16, H01F 10/26,
10/32, H03K 19/16

(21) International Application Number:
PCT/EP2004/014815

(22) International Filing Date:
24 December 2004 (24.12.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
03447312.4 24 December 2003 (24.12.2003) EP
60/533,323 29 December 2003 (29.12.2003) US

(71) Applicant (for all designated States except US): IN-
TERUNIVERSITAIR MICROELEKTRONICA
CENTRUM VZW [BE/BE]; Kapeldreef 75, B-3001
Leuven (BE).

(72) Inventors; and

(75) Inventors/Applicants (for US only): EYCKMANS,
Wouter [BE/BE]; Technische- Schoolstraat 87, B-2440
Geel (BE). LAGAE, Llesbet [BE/BE]; Oud-Strijdersstraat
109, B-3020 Herent (BE).

(74) Agents: BIRD, William, E. et al.; Bird Goën & Co, Klein
Dalenstraat 42A, B-3020 Winksele (BE).

(81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,
AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,
GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE,
KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD,
MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG,
PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM,
TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM,
ZW.

(84) Designated States (unless otherwise indicated, for every
kind of regional protection available): ARIPO (BW, GH,
GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,
ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI,
FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO,
SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN,
GQ, GW, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

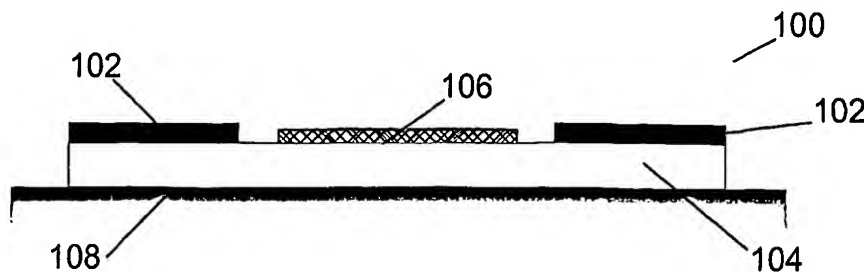
- of inventorship (Rule 4.17(iv)) for US only
- of inventorship (Rule 4.17(iv)) for US only

Published:

- with international search report
- before the expiration of the time limit for amending the
claims and to be republished in the event of receipt of
amendments

For two-letter codes and other abbreviations, refer to the "Guid-
ance Notes on Codes and Abbreviations" appearing at the begin-
ning of each regular issue of the PCT Gazette.

(54) Title: METHOD FOR ULTRA-FAST CONTROLLING OF A MAGNETIC CELL AND RELATED DEVICES



(57) Abstract: The present invention relates to a device and corresponding method for ultrafast controlling of the magnetization of a magnetic element. A device (100) includes a surface acoustic wave generating means (102), a transport layer (104), which is typically functionally and partially structurally comprised in said SAW generating means (102), and at least one ferromagnetic element (106). A surface acoustic wave is generated and propagates in a transport layer (104) which typically consists of a piezo-electric material. Thus, strain is induced in the transport layer (104) and in the ferromagnetic element (106) in contact with this transport layer (104). Due to magneto elastic coupling this generates an effective magnetic field in the ferromagnetic element (106). If the surface acoustic wave has a frequency substantially close to the ferromagnetic resonance (FMR) frequency ν_{FMR} the ferromagnetic element (106) is absorbed well and the magnetisation state of the element can be controlled with this FMR frequency. The device can be used in an RF-magnetic resonator, a sensor and a camera. The corresponding method can be used for ultrafast reading-out and switching of magnetic components and in magnetic logic.

WO 2005/064590 A1